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Is the Interest in Short Interest Coming Up Short?

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1. Intro

Within financial markets, the practice of short selling remains controversial. This is because some view short selling as a predatory act that enacts certain negative feedback loops for the stock price and the underlying company. These feedback loops can involve the short sellers disrupting real funding for the company, either by scaring creditors which in turn scares more creditors, or by forcing the bank to sell long term assets at a cheap price because the bank is forced to compensate for the short sellers lowering the banks' equity value, and thereby threatening leverage constraints the banks' short term creditors impose on their loans to the bank. Meanwhile, others view short selling as a mechanism that make stock prices more accurate by impounding negative information into the share price and make the markets more efficient.

Recent theoretical research has suggested that short selling may especially affect financial firms due to both their higher leverage and natural maturity mismatch. Leverage matters because banks also have loans that have leverage constraints in them, so when a short seller lowers the equity value of a company by lowering its stock price, they threaten the banks' funding in a very tangible manner (Brunnermeier, Markus). Natural maturity mismatch of the banks' creditors may affect banks more than other stocks since short term creditors often want to discontinue funding to a project if the NPV is lower than the liquidation value. By continuously lowering the maturity of the debt, short term creditors shift rollover risk to long term creditors and equity holders who do not benefit in the event of liquidation. Creditors have an incentive, liquidation proceeds, to lower the maturity of funding, knowing a bank has longer term assets

(Eisenbach). Additionally, financial institutions uniquely often have leverage constraints, short term creditors, contagious bank runs, and the perception of a possible large bank bailout for those institutions deemed "too big to fail". To date, little has been done to empirically test the aforementioned factors effects on and effects from short selling.

The purpose of this research is to empirically test if the stocks of financial institutions are more vulnerable to short selling than those in other sectors. We will examine if short selling especially affects banks by looking at the stock returns of both highly shorted and minimally shorted banks. This research is important because banks and financial institutions are crucial for a well-functioning economy, acting as the funnel and incubator of both capital and businesses of all shapes and sizes. Therefore, short selling can potentially affect the whole economy, making this paper distinctly policy relevant.

2. Recent Literature and Background

Other research has commonly focused on feedback loops specific to banks or short selling, but not necessarily both. If they do, they don't specifically examine short interest's role in banks' equity prices. Useful research has been done *around* this area however. For example, "Predatory Short Selling" by Markus K. Brunnermeier and Martin Oehmke, illustrates that when a financial firm is heavily shorted, especially if the short sellers are coordinated and/or large enough, that firm may be forced to sell its long term assets at a significant loss to sustain their leverage constraints for loans with their short term creditors and uninsured depositors, simply to counteract the value of their equity being reduced (Brunnermeier, Markus).

Another quirk of short selling that has been explored includes “Manipulation and the Allocational Role of Prices”, by Goldstein where he asserts that short sellers may still be able to outmaneuver an informed block holder. It’s stated that short sellers can coordinate and take advantage of the fact that their aggregate short positions result in a negative perception of the stock. This results in even an informed block holder making real investment decisions that make the short position profitable, lowering the stock’s equity value, and thereby harming the underlying company (Goldstein).

Xuewen Liu, in “Short-selling Attacks and Creditor Runs: When Morris-Shin Meets Diamond-Dybvig”, asserts that short selling, a speculative act, scares creditors from continuing to finance a bank’s projects as creditors wonder if the short sellers know something that they don’t, thereby enacting a self-fulfilling prophecy of funding being pulled, a bank’s projects failing, and the short positions becoming profitable. It’s also contended that maturity mismatch makes financial institutions more vulnerable to short selling attacks, since their assets are less liquid than their liabilities (Liu).

Although, short selling isn’t all bad. In fact, most of the time, it’s needed to provide market liquidity, price discovery, and enable zombie banks to be found out, according to a variety of studies, including “Short-Selling Bans Around the World: Evidence from the 2007–09 Crisis” by Alessandro Beber and Marco Pagano (Beber, Pagano). However, a financial firm is often in a more precarious position than firms in other sectors, due to the natural maturity mismatch of their business model in addition to their higher leverage, which was eloquently explained in “Rollover Risk as Market Discipline: A Two-Sided Inefficiency” by Thomas M. Eisenbach. Not only are the feedback loops from short selling which affects leverage constraints,

creditors confidence, and informed block holders detrimental in those respects, Thomas asserts that there is another negative feedback loop due to short term creditors affecting *other short term creditors* of a specific financial firm that's borrowing from them (Eisenbach). As one short term creditor starts to shift rollover risk during their frequent loan review periods from themselves, to long term equity holders who don't benefit in the proceeds of liquidation (another motivation for short term creditors to coordinate), other creditors take note of the increased rollover risk, pull funding, and enact another self-fulfilling prophecy.

In "The Good News in Short Interest" by Ekkehart Boehmer, he finds that short selling, as one would expect, does have a negative effect on stocks, although admittedly transient. They go on to say that the absence of short selling has a larger positive effect on stocks than does the presence of short selling's negative effect. Furthermore, the authors also state that short selling's predictive power has been theorized to be dependent on "the amount of exchange traded options, breadth of ownership, divergence in opinion about the stock, institutional ownership, whether the portfolio is value weighted or equal weighted, arbitrage operations involving convertible bonds, options, pending mergers, and indexes...hedging, tax-related trades, and relative value trades" (Boehmer).

Other, non-short interest related, potential effects that may have been overlooked when examining the relationship between banks and short interest, include the maturity rat race effect, from "The Maturity Rat Race" by Markus K. Brunnermeier and Martin Oehmke. This states that a borrower may have an incentive to shorten the maturity of a creditor's debt, since this dilutes other creditors, or in other words, reduces the value of existing debt by issuing new debt, or at least allowing the borrower to issue new debt sooner. In turn, other creditors create a cycle where

they all are competing to get shorter and shorter maturities. (Brunnermeier and Oehmke). A separate notable phenomena was in the research by Priyank Gandhi and Hanno Lustig in "Size Anomalies in U.S. Bank Stock Returns", which had found that there had become an implicit stock price premium for larger banks, due to the fact that it's generally known that while the U.S. government will often let a single large bank fail, they will usually bail them out when they're collectively at risk of going under. The outcome is that equity prices actually go up for large banks whose cash flows are decreasing, as long as their business models and decreasing cash flows are correlated, presumably increasing the chance of a bailout. Another result of this, is that they take correlated risks as well, exacerbating potential downturns (Gandhi and Lustig). Other researchers, Martin Brown, Stefan Trautmann, and Razvan Vlahu, who are responsible for "Exploring the Transmission Channels of Contagious Bank Runs" built upon the concept of correlating business models across banks and noticed that this often results in contagious bank runs and deposit withdrawals, but only if the depositors know that the banks are economically correlated (Brown et al.).

Our research aims to bring clarity to these feedback loops, many of which have not been specific to banks, and examine how and if they interact with other feedback loops and phenomena which are specific to banks. Does short selling affect bank stocks more than other stocks because of one feedback loop (e.g. creditors being spooked by either each other or short selling) or a different feedback loop (e.g. leverage constraints forcing banks to sell long term assets at fire sale prices)? Specifically, our research attempts to bring clarity to whether or not financial institutions are particularly affected by short interest. What are some hidden factors that

result in a bank being vulnerable to short selling, in terms of their equity price and their fundamental business? Is interest in short interest's effects on banks coming up…short?

3. Data Section

Our data is taken from a number of sources. CRSP or the Center for Research in Security Prices, is where our stock return data is from. The New York Federal Reserve Bank is where our sampling of banks comes from. Our short selling data is from both the NYSE and NASDAQ's monthly mid-month and end month reports, dating back to 1998 for both exchanges. Full short selling data is available until 2012. Finally, we receive our leverage data from CompuStat, a database of financial and market information on various companies.

Moving on to how the tests are conducted, at the start of each quarter examined, ten portfolios are formed. These portfolios range from most shorted, which would be portfolio one, to least shorted, which would be portfolio 10. We've organized them both by their days to cover and short interest ratio, which has yielded similar results. The portfolios were rebalanced every quarter since a rebalancing period longer than that would most likely fail to notice the effects of short selling's short term pressure, since most positions do not last longer than three weeks. If we were to choose a rebalancing period less than quarterly, we could fail to notice short selling's long term pressure, and we would need to accommodate for the short selling ban in 2008.

Another item that should be noted, is that we do not rebalance the portfolios according to the short interest ratio at the end of the quarter, but instead we take the three-month average of the short interest ratio to adjust for fluctuations.

4. Results and Conclusion

The first graph below illustrates the dollar weighted returns of the lightly shorted portfolio, when compared with the heavily shorted portfolio. This shows that, if you were to invest $1,000 dollars in each of the portfolios, the lightly shorted portfolio would exhibit an extreme outperformance when compared with the heavily shorted portfolio. For the time frame of 1994 to the end of 2012, one would make $34,350 in the lightly shorted portfolio, versus only $8,565 in the heavily shorted portfolio, if they initially invested $1,000.

Figure One: Dollar Returns if $1,000 was Invested in 1994 to 2004 in a Heavily and Lightly Shorted Bank Portfolio

The Capital Asset Pricing Model is used to determine a hypothetically appropriate required rate of return of an asset. The graph below measure Jensen's alpha, which is the difference between the average value weighted returns of our portfolios, and what the CAPM

(Capital Asset Pricing Model) says the risk adjusted return should be. What's left, is the portfolio outperformance that is not explained solely by the level of risk. With portfolio one being the most lightly shorted and portfolio 10 being the most heavily shorted, you can see that the lightly shorted portfolio is outperforming its heavily shorted counterparts even after adjusting for risk. Portfolio one returns 1.16% of **monthly** risk adjusted outperformance, leading to a yearly amount of risk adjusted returns of approximately 13.92%, compared with only a yearly risk adjusted performance of 2.99% for the portfolio with the largest amount of short selling.

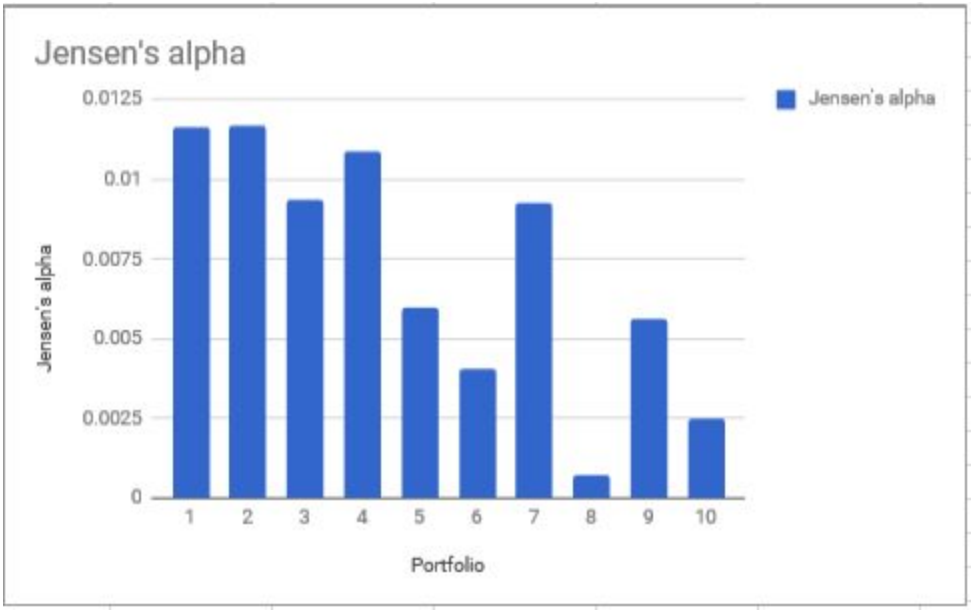

Figure Two: Jensen's Alpha in Relation to How Much Short Interest is in a Portfolio

In conclusion, financial institutions' equity prices are extremely affected by their amount of short interest. There is risk adjusted returns to be had that the market may not be accounting for, for the time period studied, by examining a financial institution's short interest. This could be a result of the aforementioned short interest feedback loops, both those that are specific to financial institutions such as banks and also those applicable to a wide variety of stocks.

Although the opinion on short selling can be divisive, short selling does provide a variety of needed services as well.

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